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(58) Field of Search

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INT CL<sup>7</sup> **G09F**

Other: Online: **EPODOC, WPI, JAPIO**

(54) Abstract Title

**An illuminated vehicle roof sign**

(57) A vehicle roof sign 1 comprises a support structure 2, a receiver 3, on the support structure for removably receiving a display sign and an illumination source 50, within the support structure 2, for illuminating a replaceable display sign, which may be protected by a transparent panel 20. The display sign may be held in the receiver by a releasable clamp 10, where the clamp has a biasing means such as a spring (11 figure 3) to bias the clamp in the holding position. The receiver may be a track such as a pair of spaced apart rails 21 for receiving the protective panel and or the display sign, and where the lower tracks 22 may have a plurality of holes to act as a water run-off outlet. The support structure may have mounting feet (40 figure 2) which may be magnetically mounted on the roof and spring loaded to allow the foot to follow the shape of the roof.

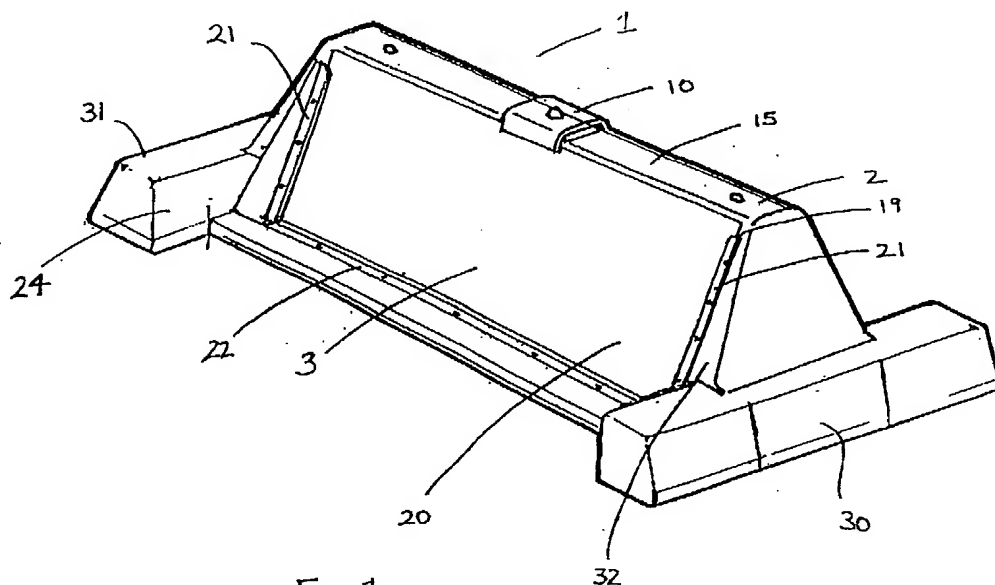


Fig. 1

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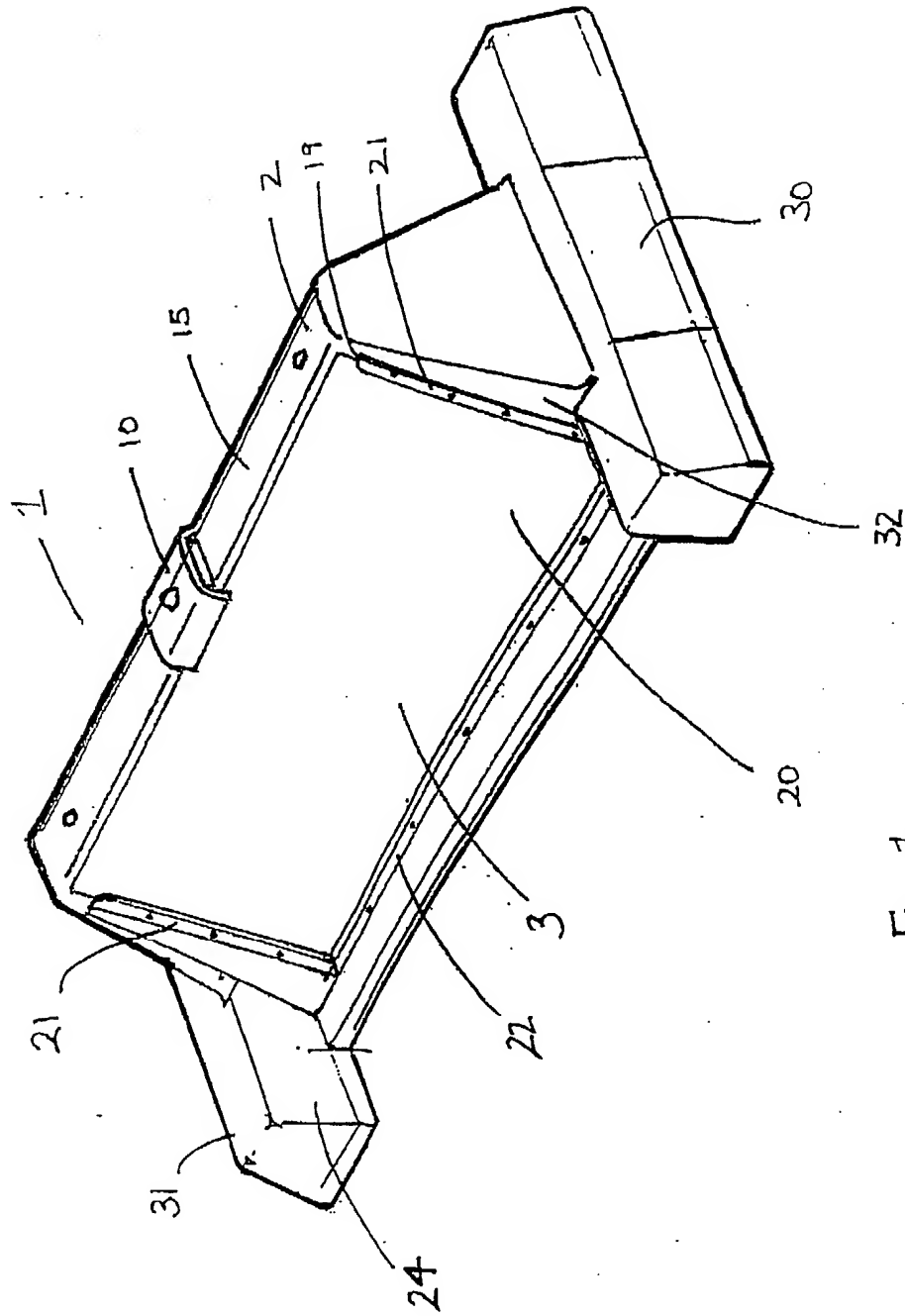


Fig. 1

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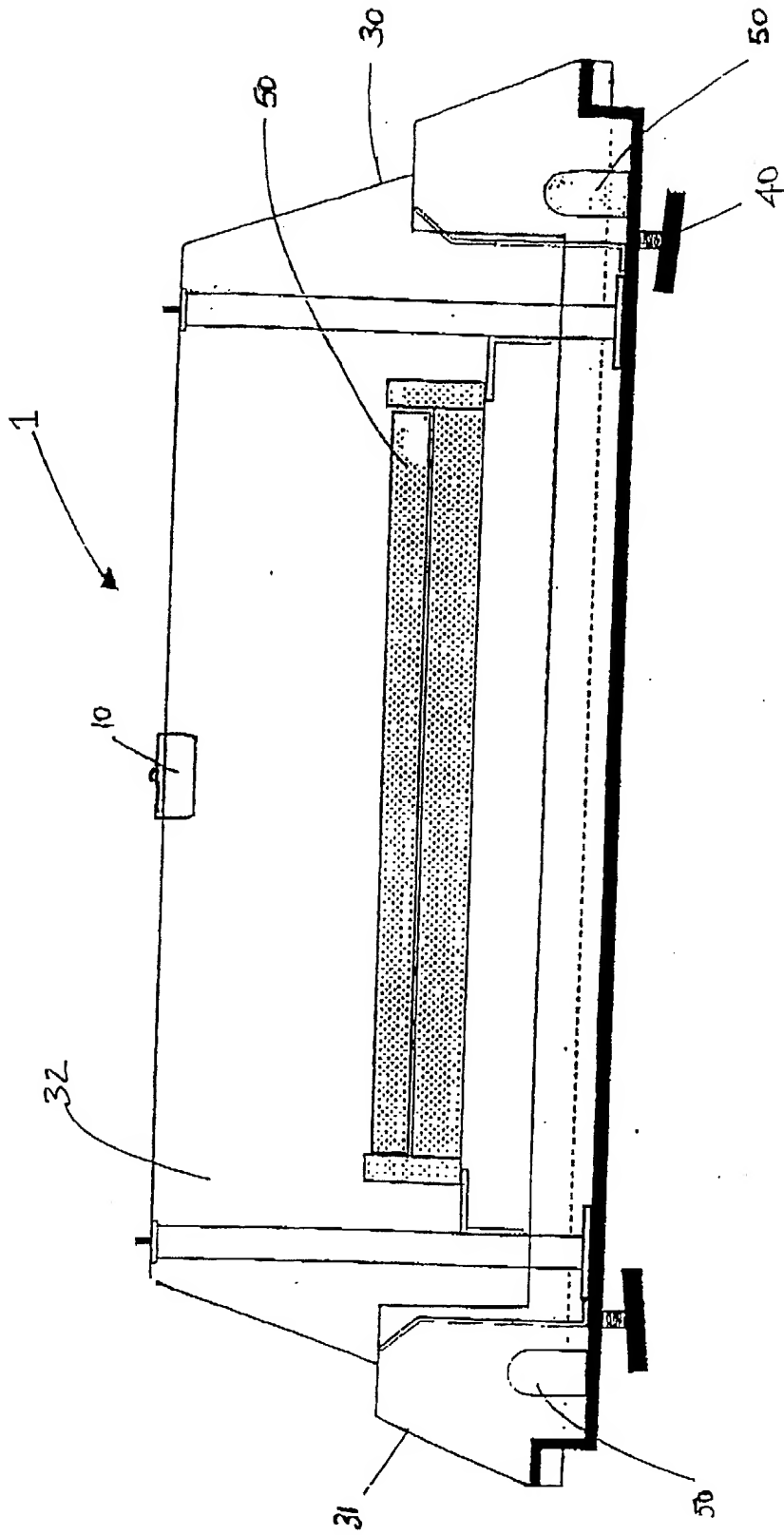


Fig. 2

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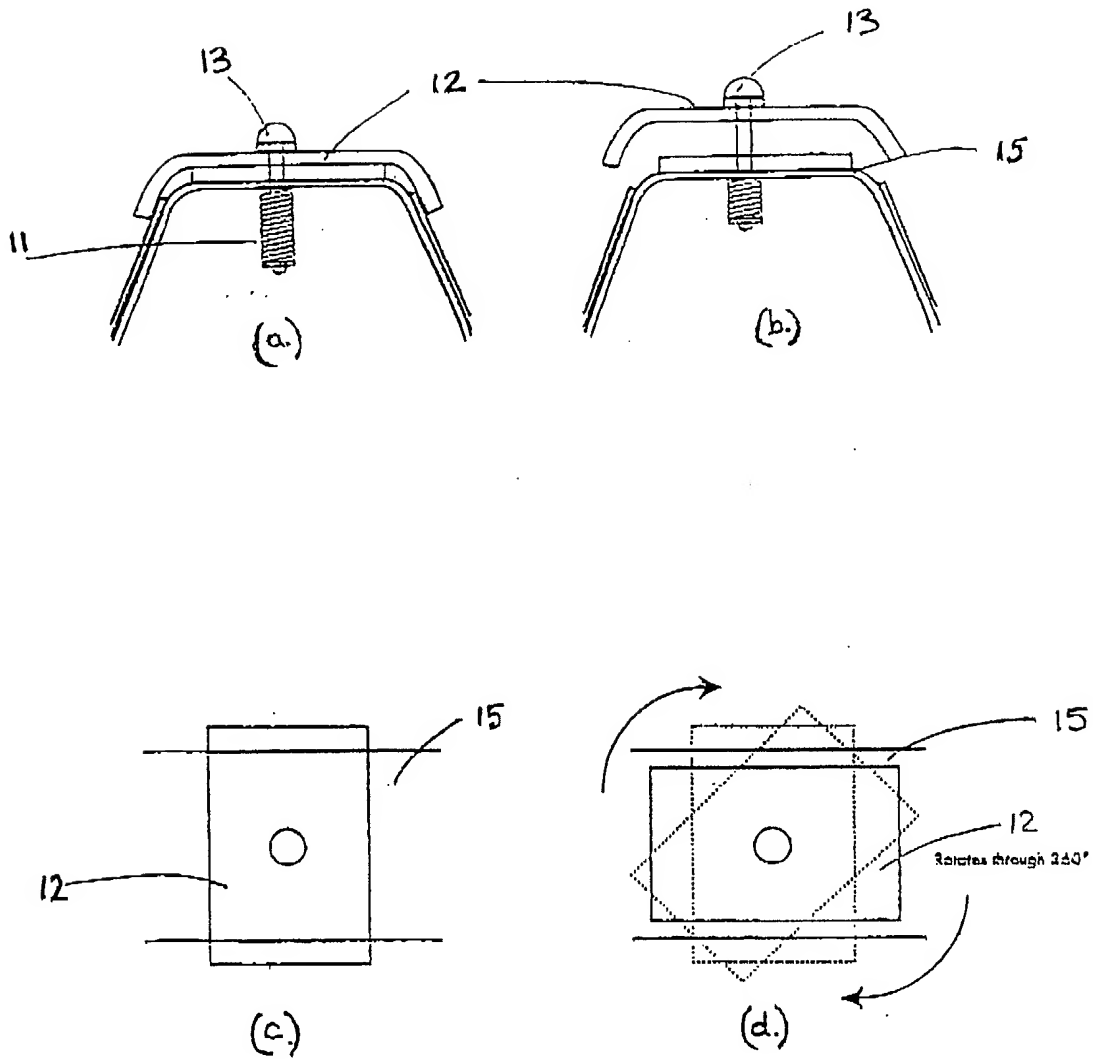


Fig. 3



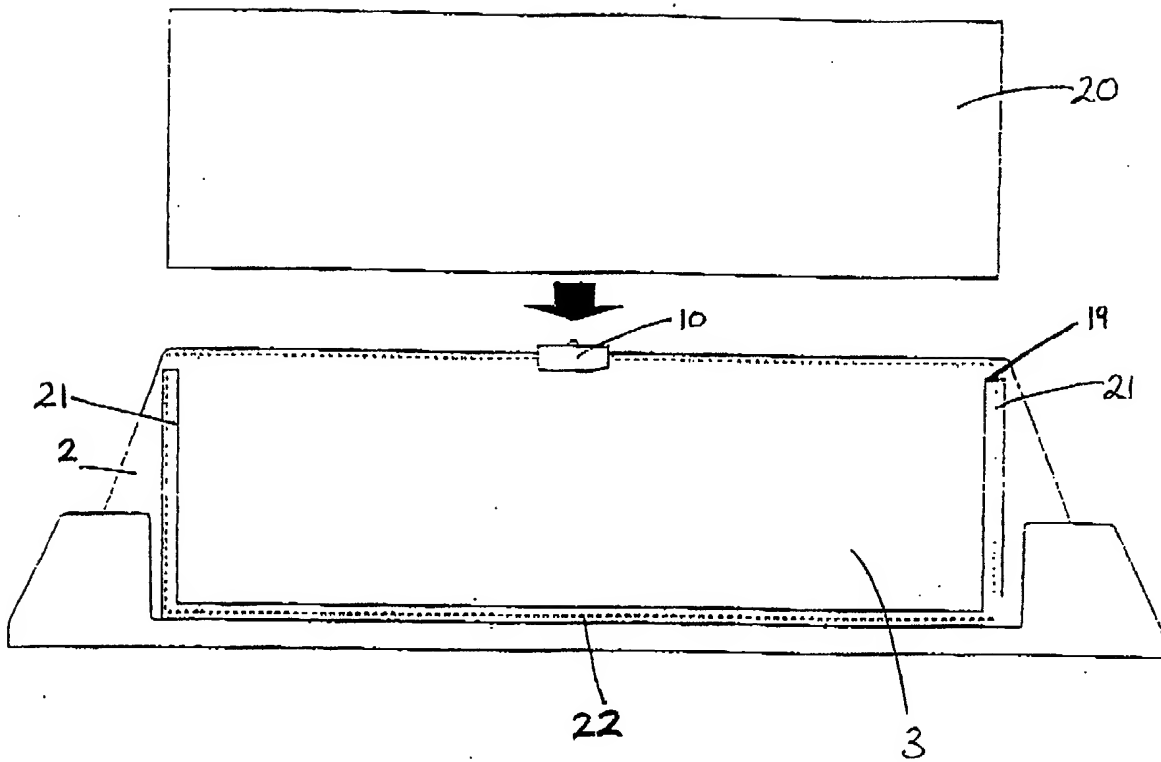


Fig. 4

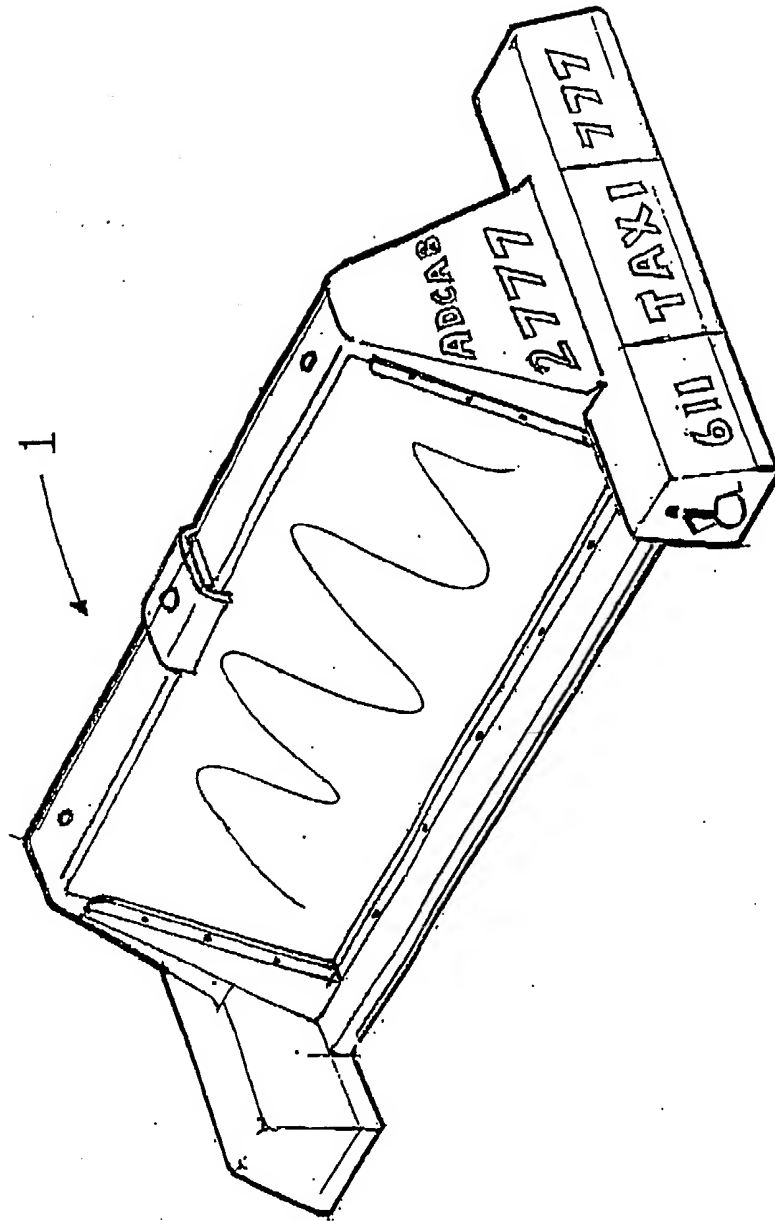


Fig. 5

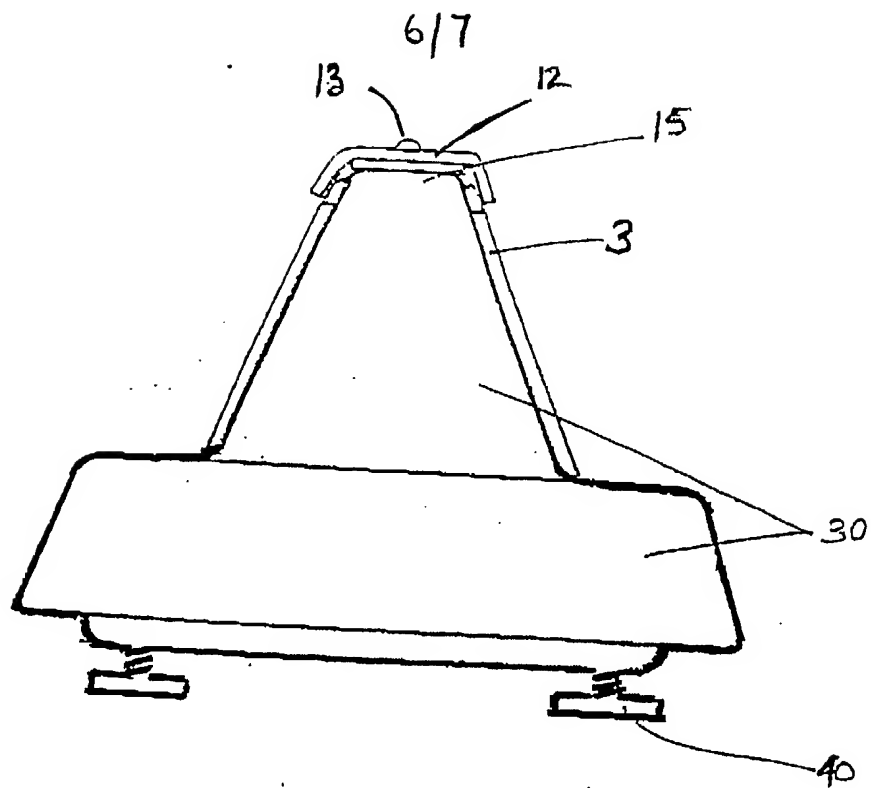


Fig. 6

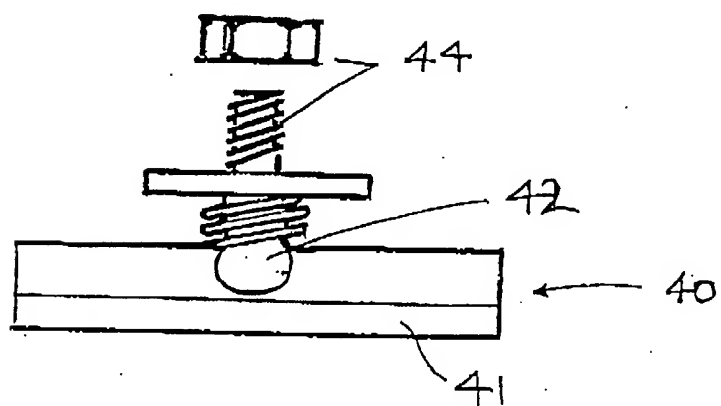


Fig. 7



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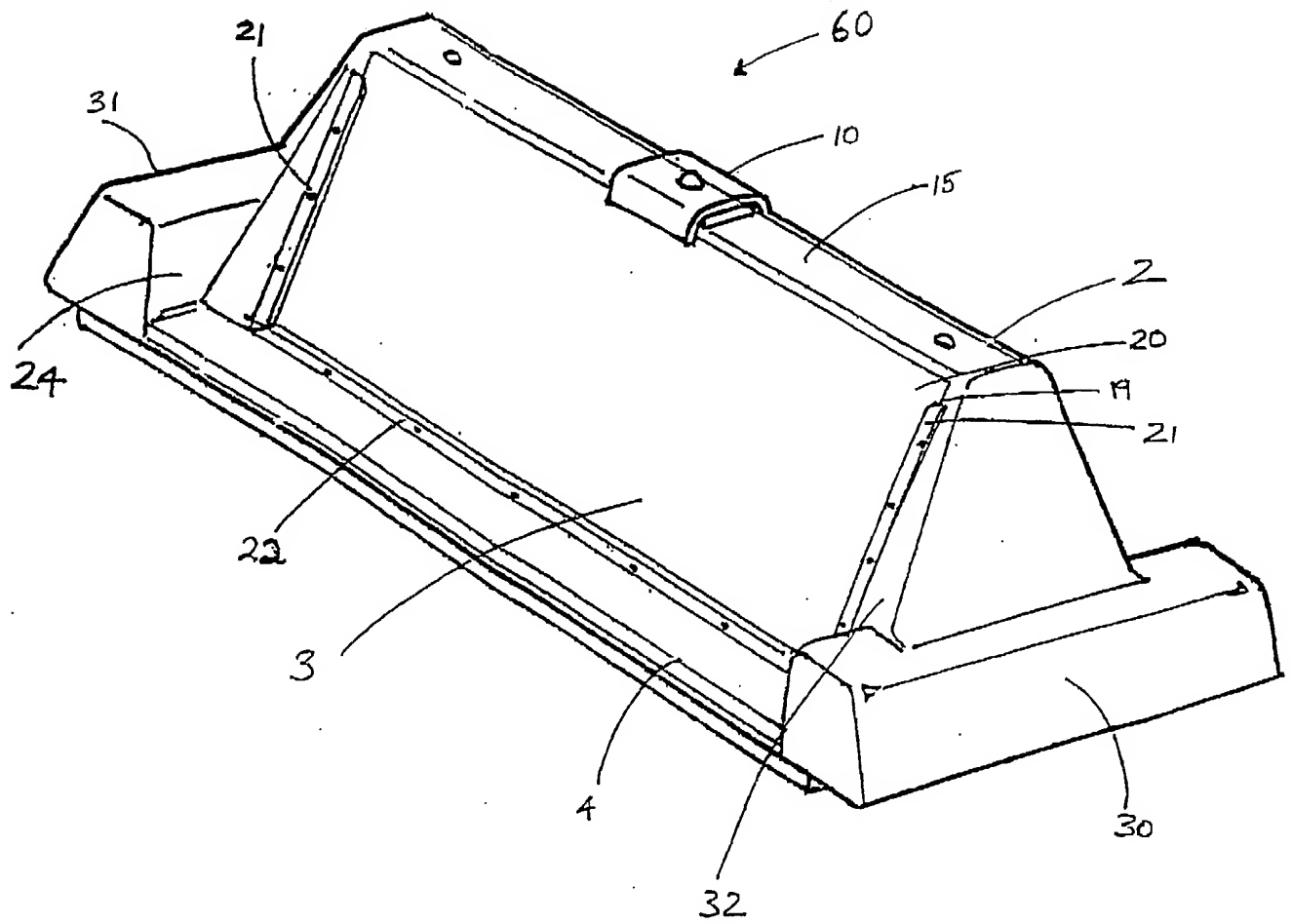


Fig. 8



"AN ADVERTISING LIGHTBOX"

Introduction

5 The invention relates to a vehicle roof sign unit for mounting on the roof of a vehicle especially on the roof of a taxi.

Back-lighted signs are mounted on taxis to display the taxi indication and availability. However such signs are generally not readily visible to oncoming traffic .  
10 or pedestrians.

The present invention provides an improved back-lighted roof sign unit for a taxi vehicle or the like.

15 Statement of Invention

According to the invention there is provided a vehicle roof sign unit comprising:-

a support structure;  
20 a receiver on the support structure for removably receiving a display sign; and  
an illumination source within the support structure for illuminating a display sign.

25 Preferably the unit comprises a releasable clamp for holding a display sign in the receiver. Most preferably the clamp is movable between a holding position in which a display sign is held in the receiver and a release position.

30 In one embodiment of the invention the clamp has biasing to bias the clamp into the holding position. Preferably the biasing comprises a spring.

In one embodiment of the invention the clamp comprises a holder and a pin, the holder being movable relative to the pin. Preferably the holder is rotatable relative to the pin in the release position.

5 Most preferably the holder is movable axially on the pin between the holding and release positions.

10 Preferably biasing is provided between the holder and the pin to bias the holder into the holding position. Most preferably the biasing comprises a coil spring around the pin.

15 In one embodiment of the invention the receiver comprises a track for receiving a protective panel and a display sign. Preferably the track is defined between the support structure and rails spaced-apart from the support structure. The track is defined by a pair of side rails mounted to the support structure. The track may comprise a lower track element between the side rails at a base thereof. Preferably the track is open at a top thereof to slidably receive a protective panel and display sign.

20 In one embodiment of the invention the side rails at the front end of the unit comprise an aperture(s). This allows for a flow of air between the protective panel and the display sign and avoids moisture build up.

In one embodiment of the invention the protective panel is of a transparent material.

25 In another embodiment of the invention the lower track element comprises a water run-off outlet. Preferably the water run-off outlet is provided by a plurality of outlet holes in the lower track element.

In one embodiment of the invention the support structure of the unit defines a front portion, a rear portion and side portions between the front and rear portions. Preferably the front and rear portions comprise receivers for displaying signs.

5 Each of the side portions comprises a display face. Preferably the side display face extends inwardly from a base towards a top of the unit. Most preferably the side display face comprises an upper section and a lower section. The upper section may be stepped inwardly from the lower section.

10 Preferably at least part of the side portion of the support structure is occluded from the front and rear portion of the support structure.

In one embodiment of the invention at least part of the side portion has a side illumination source.

15 In another embodiment of the invention the front and rear portion of the support structure has an illumination source.

The support structure of the unit may be of a translucent or transparent material.

20 According to the invention the unit also comprises a mounting means for mounting the unit on a roof of a vehicle. Preferably the mounting means comprises at least two spaced-apart mounting feet.

25 Preferably the mounting feet are releasable from a vehicle roof. Most preferably the mounting feet are magnetically mountable to a vehicle roof.

In one embodiment of the invention the mounting feet are spring loaded.

Brief description of the Drawings

The invention will be more clearly understood from the following description given by way of example only with reference to the accompanying drawings, in which:-

5

Fig. 1 is a side perspective view of a vehicle roof sign unit of the invention;

Fig. 2 is a partially cut-away representation of the unit from the side;

10

Fig. 3(a) is an exploded view of a clamp of the invention in a holding position;

Fig. 3(b) is an exploded view of the clamp of Fig. 4(a) in a partially released position;

15

Fig. 3(c) is a top plan view of a clamp of the invention in a holding position;

Fig. 3(d) is a top plan view of the clamp of Figs. 4 (a) and (b) rotating between a holding and release position;

20

Fig. 4 is a schematic representation of a protective panel inserted into a side portion of a unit of the invention;

Fig. 5 is a side perspective schematic view of the vehicle roof sign of the invention.

25

Fig. 6 is an end perspective view of the unit;

Fig. 7 is an enlarged partially cut-away representation of mounting means for mounting a unit of the invention to a vehicle roof; and

30

Fig. 8 is a side perspective view of another vehicle roof sign unit of the invention;

5     Detailed description

Referring to the drawings there is illustrated a vehicle roof sign unit 1 according to the invention. The unit 1 comprises a support structure 2, a receiver 3 on the support structure 2 for removably receiving a display sign and an illumination source 50 within the support structure for illuminating the display sign. The display sign is protected by a transparent protection panel 20.

The unit 1 comprises a releasable clamp 10 for holding the protective panel 20 and a display sign in the receiver 3. The clamp 10 is movable between a holding position in which the protective panel 20 and a display sign are held in the receiver 3 and a release position in which the display sign may be removed and exchanged for a new display sign.

Referring in particular to Figs. 3 (a) to (d) the clamp 10 has biasing in the form of a coil spring 11 to bias the clamp 10 into the holding position as shown in particular in Fig. 3(a). The clamp 10 comprises an inverted channel holder 12 and a pin 13 fixed to the support structure 2. The holder 12 is movable relative to the pin 13 from a locking or clamped position of Fig. 3(a) to a release position of Fig. 3(b).

Fig. 3(b) shows the partial release of the clamp 10 and Figs. 3(c) and (d) show the rotation of the holder 12 on moving from the locking position (Figs. 3(a) and (c)) where the holder 12 lies across a top portion 15 of the support structure 2 to a release position (Fig. 3(d)) where the holder lies along the top portion 15 of the support structure 2 as indicated by full lines.

The holder 12 is movable axially on the pin 13 between the holding and release positions. The spring biasing is provided between the holder 12 and the pin 13 to bias the holder into the holding position.

5        Although only one releasable clamp 10 is shown it is anticipated that the unit may have several such clamps spaced along the top portion 15 of the unit, if required. There may be a number of separate display signs.

10       It is also anticipated that the unit may not require the presence of a releasable clamp. In this case the receiver 3 for receiving the protective panel 20 and a display sign is held securely in position by means of a receiving track. Such a unit would be preferred in that they are easier to manufacture.

15       The receiver 3 on the unit comprises a track for receiving the protective panel 20 and a display sign. The track is defined between the support structure 2 and rails spaced apart from the support structure 2. In this case there are a pair of side rails 21 and a lower track element 22 extending between the side rails 21 at a base thereof.

20       The track is open at a top thereof defining a slot 19 for slidably receiving the protective panel 20 and a display sign. Fig. 4 shows in more detail a protective panel 20 being slid into position between the track and support structure. When a protective panel 20 is in position and the clamp 10 is released, a display sign can be inserted between the protective panel 20 and support structure 2. The clamp 10 is engaged to hold the protective panel 20 and the display sign in the receiver 3.

25       The side rails 21 at the front end of the unit 1 comprise an aperture(s) to allow a flow of air to pass between the protective panel and the display sign. This prevents moisture build up on the protective panel and/or the display sign.

30       The protective panel 20 provides protection and support for a display sign. It is typically wholly transparent and/or translucent such that the visibility of the display



sign is not affected. Typically, the panel is made from any suitable plastics material which is impact resistant and of low-inflammability.

5 A display sign alone may be present without a protective panel. In this instance the display sign is of a self supporting material which is capable of withstanding weather conditions.

10 The display sign is held securely in position by means of the side rails 21 and lower track element 22.

15 The lower track element 22 of the receiver 3 comprises a water run-off outlet. The run-off outlet is provided by a plurality of outlet holes (not shown) in the lower track element 22. The protective panel 20 and display sign are inserted between the track and support structure 2 so that the top end is open to wash water and/or rain water. The water can therefore flow freely between the support structure 2, the display sign and the protective panel 20. The outlet holes in the lower track element 22 allow the water to flow away from the unit.

20 The support structure 2 of the vehicle roof sign unit 1 of the invention defines a front portion 30, a rear portion 31 and side portions between the front and rear portions. The support structure is typically a pre-moulded hollow unit of translucent and/or transparent plastics material. The material of the unit is required to withstand cracking, crushing, splitting and vandalism. On the other hand it is also lightweight, durable, tough and safe. The support structure is preferably manufactured from a  
25 moulded plastics material such as polyester preferably opal polyester. The support structure typically sits on a base tray which may be manufactured from acrylonitrile-butadiene-styrene (ABS). Two quick-release bolt connections allow the support structure to be removed from the base tray for cleaning, maintenance and replacement of the illumination means. The bolts fixing the support structure to the  
30 base tray may be in the side portion or in the front and rear end sections of the unit 1. A sealant typically a rubber sealant is used to seal between the support structure and

the base tray to avoid any water or moisture getting inside the unit. The unit 1 is capable of withstanding adverse weather conditions and is completely waterproof.

5 The front 30 and rear 31 portions of the support structure 2 comprise receivers for displaying signs as shown in particular in Fig. 5 where a schematic representation of the display signs on a unit is given. Distinct receiver areas for example (A, B, C, D) are present on the front 30 and rear 31 portions. In this instance the display material on the front and rear portions is typically permanently or semi-permanently attached and displays the taxi numbers and indications such that the taxi is capable of  
10 accommodating wheelchairs for example. The display signs, in particular the display material displayed on the front and rear portions of the unit may include reflective material to make the display signs more visible.

15 Each of the side portions of the support structure 2 comprises a display face. The side display face extends inwardly from a base portion 4 towards a top portion 15 of the unit. The side display face comprises an upper 32 and lower 33 section the upper section being stepped inwardly from the lower section.

20 At least part of the side portion of the support structure is occluded from the front 30 and rear 31 portion of the support structure by a partial side-wall 24.

25 At least part of the side portion has a side illumination source 50. The front 30 and rear 31 portions also comprise independent illumination sources 50. Preferably the or each illumination source is a fluorescent light source. Typically 12 volt fluorescent tube lamps are used which provides an even spread of light in comparison to bulbs.

30 The illumination means are powered through a 12 volt battery which is independently/separately connected to each illumination source 50. The end of the base tray of the unit is fitted with an approved socket and plug connection for example a I.P 68 rated socket and plug connection. The plug is fitted with

approximately 3 metres of 0.5 square 3-core PVC cable. An internal lighting wiring in two circuits is thereby provided. All cables and lights are compliable with EC safety regulations and the connection assembly is lockable and centralised on the rear of the unit for safety.

5

The display signs indicating the taxi numbers at the front or rear portion of the unit may be independently extinguished when the taxi is occupied with a fare while the display face of the side portions remain illuminated at all times if desired.

10 The unit 1 of the invention also comprises a mounting means for mounting and fixing the unit on a roof of a vehicle. The mounting means comprises at least four spaced-apart mounting feet 40 as shown in particular in Figs. 2, 6 and 7. The mounting feet 40 comprise heavy duty magnetic pads 41 bolted by means of a nut and screw bolt 44, to a sub-frame. The magnetic pad 41 has a spring knuckle joint  
15 42 which allows the magnetic pad 41 to follow the shape of the roof thereby enabling extra grip. This is advantageous in that the unit can be assembled on the roof of most vehicles.

The mounting means of the unit is especially advantageous in that a vehicle roof does not need to be altered in any way to accommodate the vehicle roof unit of the  
20 invention. The unit can be assembled and unassembled on a vehicle roof very quickly.

Another embodiment of the invention is illustrated in Fig. 8 in which parts similar to those of Fig. 1 are assigned the same reference numerals. The unit 60 has front 30  
25 and rear 31 portions which are shorter than in the unit of Fig. 1. The unit is suitable for application where less or smaller display material is displayed on the front and rear portions of the unit.

There are many advantages to the vehicle roof sign unit of the present invention. In  
30 comparison to current roof signs the unit of the invention is larger and brighter and is typically mounted lengthways on the roof of a vehicle for maximum visibility. The

5 use of fluorescent illumination means makes the unit more conspicuous and visible over a wide area. The illumination means comprises fluorescent tubes rather than bulbs which ensures an even spread of light. Reflectors on the surface of the unit can also be used to increase the visibility of the roof sign unit. In particular the unit of the invention is more visible to people with disabilities such as people in wheelchairs or partially sighted people who at present have difficulty in identifying oncoming taxis and determining whether they are available for hire. The unit of the invention allows a taxi to be more easily identified.

10 The unit of the invention also maximises the advertising impact while optimising the compulsory taxi indications and vehicle registration numbers. It combines a taxi sign with a novel quick-release advertising feature wherein general advertising, government information and public notices for example are backlit for optimum impact.

15 For the advertiser the unit provides an ideal means to advertise widely. The advertising material can also be quickly and easily interchanged on a regular basis. There is in addition no need for the use of adhesives or other such material for displaying the advertising material. A display sign is securely held in place by the receiver means. The display may or may not require the presence of a protective panel. The lower track element 22 of the receiver 3 comprises a water run-off outlet, therefore the unit is capable of withstanding weather conditions without compromising the visual impact.

25 A further advantage of the invention is its simplicity of design and manufacture. It is easy to assemble on a car roof or remove if necessary. The display signs may also be quickly and easily interchanged.

30 In addition the unit of the invention is aerodynamically styled for safety, fuel, economy and noise reduction.

CLAIMS

1. A vehicle roof sign unit comprising:-
  - 5 a support structure;
  - a receiver on the support structure for removably receiving a display sign; and
  - 10 an illumination source within the support structure for illuminating a display sign.
2. A unit as claimed in claim 1 comprising a releasable clamp for holding a display sign in the receiver.
- 15 3. A unit as claimed in claim 2 wherein the clamp is movable between a holding position in which a display sign is held in the receiver and a release position.
4. A unit as claimed in claim 3 wherein the clamp has biasing to bias the clamp into the holding position.
- 20 5. A unit as claimed in claim 4 wherein the biasing comprises a spring.
6. A unit as claimed in any of claims 3 to 5 wherein the clamp comprises a holder and a pin, the holder being movable relative to the pin for movement between the holding position and the release position.
- 25 7. A unit as claimed in any of claims 3 to 6 wherein the holder is rotatable relative to the pin in the release position and is movable axially on the pin between the holding and release positions.
- 30

18. A unit as claimed in claim 17 wherein the water run-off outlet is provided by a plurality of outlet holes in the lower track element.
- 5 19. A unit as claimed in any preceding claim wherein the support structure defines a front portion, a rear portion and side portions between the front and rear portions.
20. A unit as claimed in claim 19 wherein the front and rear portions comprise receivers for displaying signs.
- 10 21. A unit as claimed in claim 19 or 20 wherein each of the side portions comprises a display face.
- 15 22. A unit as claimed in claim 21 wherein the side display face extends inwardly from a base towards a top of the unit.
23. A unit as claimed in claim 21 or 22 wherein the side display face comprises an upper section and a lower section.
- 20 24. A unit as claimed in claim 23 wherein the upper section is stepped inwardly from the lower section.
- 25 25. A unit as claimed in any of claims 19 to 24 wherein at least part of the side portion of the support structure is occluded from the front and rear portion of the support structure.
26. A unit as claimed in claim 25 wherein at least part of the side portion has a side illumination source.
- 30 27. A unit as claimed in claim 25 wherein the front and rear portion of the support structure has an illumination source.

